

REMARKS

This is intended as a full and complete response to the Office Action dated July 13, 2006, having a shortened statutory period for response set to expire on October 13, 2006. Please reconsider the claims pending in the application for the reasons discussed below.

Claims 1-18, 28-33, and 35-36 remain pending in the application and are shown above. Applicants have canceled claims 19-27 and 34. Claims 1- 5, 19, 20, 23, 24, 28-31, and 34-36 are rejected. Claims 6-18, 21, 22, 25-27, 32, and 33 are objected to. The Examiner has indicated that claim 9 would be allowable if amended to overcome the objection set forth in the office action. Reconsideration of the rejected claims is requested for the reasons presented below.

In the specification, paragraphs [0043] and [0048] have been amended to correct minor editorial problems. Applicants submit that the changes made herein do not introduce new matter.

Claims 1, 9, and 28 are objected to for including the phrase "one or more wavelengths." Applicants have amended claims 1, 9, and 28 to replace the phrase "one or more wavelengths" with "a wavelength." Applicants submit that the changes made herein do not introduce new matter. Applicants respectfully request withdrawal of the objection to claims 1, 9, and 28.

Claims 19, 23, and 34 are objected to because the Examiner finds the phrase "about 0.84 or greater" indefinite. Applicants have canceled claims 19, 23, and 34.

Applicants have also amended claims 1, 9, 28, 29, and 31 to more clearly recite the claimed subject matter. Applicants have added new claims 37-46 to claim additional aspects of the invention. Applicants submit that the changes made herein do not introduce new matter.

Claims 1-5, 19, 20, 23, 24, 28-31, and 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hayashi, et al.* (U.S. Patent No. 5,599,590) in view of *Kroon, et al.* (U.S. Patent No. 6,747, 282) and *Sandhu, et al.* (U.S. Patent Publication No. 2005/0056940). Regarding claim 1, the Examiner states that *Hayashi, et al.* teaches a method comprising depositing a layer comprising amorphous carbon on a substrate

(column 2, lines 5, 6, and 15) and then exposing the substrate to electromagnetic radiation (*i.e.*, CO₂ laser, column 4, lines 48-50 and 63) under conditions sufficient to heat the layer to a temperature of 300-1000°C (column 4, lines 55-57). The Examiner acknowledges that *Hayashi, et al.* does not teach that the wavelength of the electromagnetic radiation is between about 600 nm and about 1,000 nm. The Examiner states that *Kroon, et al.*, in analogous art, teaches exposing amorphous carbon to electromagnetic radiation having a wavelength between 400 and 1,100 nm since such a wavelength range can be absorbed by the amorphous carbon. The Examiner concludes that it would have been obvious to modify the electromagnetic radiation of *Hayashi, et al.* to be within the range of 400 and 1,100 nm, as suggested by *Kroon, et al.*, since the radiation could be readily absorbed by the amorphous carbon. Applicants respectfully traverse the rejection.

Hayashi, et al. describes amorphous carbon coatings and carbon substrates for magnetic disks and a method of heating the coatings to obtain a desired magnetic disk surface roughness (abstract, column 4, lines 48-50). *Hayashi, et al.* states that a suitable CO₂ laser for heating the coatings has a wavelength of 10.4 microns, *i.e.*, 10,400 nm (column 4, lines 65-66). *Kroon, et al.* describes a lithographic projection apparatus (abstract). *Kroon, et al.* only discusses amorphous carbon as a potential contaminant on the sensors of the apparatus and states that the thickness of an amorphous carbon layer on the sensors can be estimated by a method that includes exposing the sensors to radiation in the range of 400 to 1100 nm, which is absorbed by the amorphous carbon (column 12, lines 39-65). *Sandhu, et al.* does not teach or suggest exposing an amorphous carbon layer to electromagnetic radiation having a wavelength between about 600 nm and about 1000 nm or heating an amorphous carbon layer. Applicants respectfully submit that the combination of *Hayashi, et al.*, *Kroon, et al.*, and *Sandhu, et al.* does not teach or suggest using the 400-1100 nm wavelength radiation provided by *Kroon, et al.* for a method of detecting the thickness of an amorphous carbon layer as the radiation source in *Hayashi, et al.*'s substantially different method, which uses radiation to heat a carbon surface of a magnetic disk in order to roughen the surface of the magnetic disk.

Thus, *Hayashi, et al.* in view of *Kroon, et al.* and *Sandhu, et al.* does not teach or suggest a method of processing a substrate comprising silicon, comprising depositing a layer comprising amorphous carbon on the substrate, and then exposing the substrate to electromagnetic radiation having a wavelength between about 600 nm and about 1000 nm under conditions sufficient to heat the layer to a temperature of at least about 300°C, as recited in claim 1. Applicants respectfully request withdrawal of the rejection of claim 1 and of claims 2-5, which depend thereon.

Applicants submit that the rejection of claims 19, 20, 23, 24, and 34 is moot, as Applicants have canceled claims 19, 20, 23, 24, and 34.

Regarding claim 28, the Examiner notes that claim 28 is a product-by-process claim and that the final product is a substrate having a radiation treated amorphous carbon layer. The Examiner states that the teachings of *Hayashi, et al.* also read on claim 28, as stated in the rejection of claim 1. Applicants respectfully traverse the rejection.

As amended, claim 28 specifies that the substrate on which the amorphous carbon layer is deposited comprises silicon. Applicants respectfully submit that *Hayashi, et al.* does not teach or suggest that the magnetic disks upon which the amorphous carbon layer is deposited comprise silicon. Applicants further submit that *Hayashi, et al.*, individually or in combination with *Kroon, et al.* and *Sandhu, et al.*, does not teach or suggest a substrate comprising silicon and having an amorphous carbon layer thereon, wherein the substrate is exposed to electromagnetic radiation having a wavelength between about 600 nm and about 1000 nm under conditions sufficient to heat the layer to a temperature of at least about 300°C. Thus, *Hayashi, et al.* in view of *Kroon, et al.* and *Sandhu, et al.* does not teach or suggest all of the elements of claim 28. Applicants respectfully request withdrawal of the rejection of claim 28 and of claims 29-31, which depend thereon.

Claims 28-31, 35, and 36 are objected to under 37 C.F.R. § 1.75 as being a substantial duplicate of claims 1-4, 7, and 8. Applicants respectfully traverse the objection to claims 28-31, 35, and 36. Claims 28-31, 35, and 36 are product-by-process claims, while claims 1-4, 7, and 8 are process claims. The products of claims 28-31, 35, and 36 are made by the processes of claims 1-4, 7, and 8, respectively. Thus, product

claims 28-31, 35, and 36 and process claims 1-4, 7, and 8 are not substantial duplicates of each other. Applicants respectfully request withdrawal of the objection to claims 28-31, 35, and 36.

Claims 6-8, 21, 22, 25-27, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants submit that the objection to claims 21, 22, and 25-27 is moot, as Applicants have canceled claims 21, 22, and 25-27. Applicants respectfully submit that claims 6-8 are also patentable for the reasons discussed above with respect to independent claim 1, from which they depend. Applicants submit that claims 32 and 33 are also patentable for the reasons discussed above with respect to independent claim 28, from which they depend. Applicants respectfully request withdrawal of the objection to claims 6-8, 32, and 33.

Claims 10-18 are objected to as being dependent upon an objected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 10-18 depend on claim 9. Applicants have amended claim 9 as requested by the Examiner. The Examiner has indicated that claim 9 would be allowable if rewritten to overcome the objection to claim 9. Applicants respectfully request allowance of claim 9 and withdrawal of the objection to claims 10-18, which depend thereon.

New claim 37 recites a method of processing a substrate comprising silicon, comprising depositing a layer comprising amorphous carbon on the substrate, and then exposing the substrate to pulses of electromagnetic radiation under conditions sufficient to heat the layer to a temperature of at least about 300°C. Applicants respectfully submit that new claim 37 is patentable, as *Hayashi, et al.*, *Kroon, et al.*, and *Sandhu, et al.*, individually or in combination, do not teach or suggest exposing a substrate comprising silicon and having an amorphous carbon layer thereon to pulses of electromagnetic radiation to heat the amorphous carbon layer. Applicants respectfully request allowance of new claim 37 and of new claims 38-41, which depend thereon.

New claim 42 recites a method of a method of processing a substrate comprising silicon, comprising depositing a layer comprising amorphous carbon on the substrate, and then exposing the substrate to electromagnetic radiation provided by a lamp under

conditions sufficient to heat the layer to a temperature of at least about 300°C. Applicants respectfully submit that new claim 37 is patentable, as *Hayashi, et al.*, *Kroon, et al.*, and *Sandhu, et al.*, individually or in combination, do not teach or suggest exposing a substrate comprising silicon and having an amorphous carbon layer thereon to electromagnetic radiation provided by a lamp under conditions sufficient to heat the amorphous carbon layer. Applicants respectfully request allowance of new claim 42 and of new claims 43-46, which depend thereon.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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